

ANNUAL SUMMARY FOR 1889.

The following general discussion of the weather over the United States during 1889 is based upon seven charts, published herewith, which show, respectively, the annual mean temperature and the departures from the normal temperature; the annual mean atmospheric pressure and the prevailing winds; the absolute ranges of temperature; the maximum temperatures; the minimum temperatures; the annual precipitation; and the departures of the annual precipitation from the annual normal precipitation. These charts have been prepared from data received from about 1,000 regular and voluntary observers of the Signal Service. An index of the MONTHLY WEATHER REVIEW for 1889 is also published herewith.

TEMPERATURE.

The annual mean temperature was highest in adjoining parts of southeastern California and southwestern Arizona, and in extreme southern Florida, where it rose above 75°; and in the southern half of Florida, at Port Eads, La., in the lower Rio Grande valley, and in the lower Colorado and Gila valleys, mean readings of 70° or above were reported. The mean temperature was above 50° south of a line traced from southern New England irregularly westward to Denver, Colo., thence southward to central New Mexico, thence westward to central Arizona, and west of this line continued northwestward to extreme northeastern California, thence southeastward to central Utah, and thence northwestward to extreme northwestern Washington. The annual mean temperature was lowest in Manitoba, where it fell below 35°, and the mean values were below 40° north of a line traced from the west-central coast of the Gulf of Saint Lawrence westward over Canada and extreme northern Michigan to central Minnesota, and thence west-northwest into the British Possessions north of Montana. The mean readings were also below 40° in an area occupying the more elevated part of west-central Colorado.

The most marked departures above the normal temperature occurred in western Minnesota, North Dakota, north-central Montana, in the British Possessions north of North Dakota and Montana, and on the southwest coast of the Gulf of Saint Lawrence, where they exceeded 3°, and the departures above the normal temperature were 2° or more in Nova Scotia and eastern New Brunswick, in central Pennsylvania, and along the northern border of the country from Minnesota and the eastern part of the Dakotas to northern Idaho. The departures below the normal temperature equalled or exceeded 1° on the coast of eastern Maine, on the immediate south Atlantic coast south of South Carolina, in the Florida Peninsula, at Mobile, Ala., and in central Texas; elsewhere the departures below the normal temperature were less than 1°.

At stations in New England, the middle Atlantic states, Arkansas, Texas, Iowa, the Dakotas, Minnesota, Montana, Colorado, and on the Pacific coast, the annual mean temperature was the highest ever reported. The following are some of the more notable departures of the mean temperature for the current year above the highest previous annual mean temperature: Boston, Mass., mean for 1889, 50° 7, 1° 3 above mean for 1880; New York City, mean for 1889, 53° 5, 0° 6 above mean for 1878; Fort Smith, Ark., mean for 1889, 61° 6, 0° 8 above mean for 1887; Saint Vincent, Minn., mean for 1889, 37° 3, 1° 8 above mean for 1881; Portland, Oregon, mean for 1889, 54° 8, 0° 5 above mean for 1885; San Francisco, Cal., mean for 1889, 57° 9, 0° 6 above mean for 1877; San Diego, Cal., mean for 1889, 62° 6, 0° 4 above mean for 1885.

The highest absolute maximum temperature reported by a regular station of the Signal Service was 117° at Yuma, Ariz., on July 3d, and the maximum temperature rose above 100° over a greater part of the plateau region south of the Columbia River, on the Pacific coast south of the fortieth parallel, save along the immediate coast line, and from eastern Montana and the Dakotas southward over the eastern slope of the Rocky Mountains to the Rio Grande Valley. East of the

ninety-seventh meridian maximum temperatures of 100° or above were not reported by regular observers of the Signal Service, and the maximum readings were above 95° in a narrow belt running from the Red River of the North Valley to the west Gulf states, in the Atlantic states from central Virginia to northern Florida, and in the interior of the east Gulf states. The lowest maximum temperatures were noted on the coast of northern California, and in extreme eastern Massachusetts, where they fell to or below 80°, and the maximum readings were below 85° on the coast of Washington, and at coast stations in southeastern New England.

At Salt Lake City, Utah, the absolute maximum temperature, 102°, was the highest ever reported at that station, the highest previous maximum temperature, 101°, being noted in 1875. The highest absolute temperature ever reported by a regular station of the Signal Service was 119° at Fort McDowell, Ariz., in 1887.

The lowest absolute minimum temperature reported by a regular station of the Signal Service was -43°, at Saint Vincent, Minn., on February 23d; the minimum values were below -30° from Minnesota northwestward over North Dakota and northeastern Montana, and in northern Vermont; they were below -10° north of a line traced from southern Maine south of west over the lower lake region, the upper Mississippi and middle Missouri valleys to southern South Dakota, thence southwest to south-central Colorado, thence northwest to eastern Idaho, and thence northward over western Montana, and in an area in north-central Nevada; and were below zero north of a line traced from southern New England south of west to central Arizona, and east of this line continued northwestward to northwestern Nevada, and thence northward to the British Possessions north of extreme western Montana. The only sections in which the minimum temperature was above 32° (the freezing point) were Florida south of the thirtieth parallel, the Texas coast south of Galveston, the California coast south of the fortieth parallel, and in extreme southern California and southwestern Arizona.

Unprecedentedly low minimum temperatures were reported for the current year. The lowest absolute minimum temperature ever reported by a regular station of the Signal Service was -63°, at Poplar River, Mont., in 1885.

The greatest yearly ranges in temperature occurred in the Valley of the Red River of the North, and thence westward to Montana, where they exceeded 130°; they exceeded 100° north of a line traced from the middle New England coast south of west to central Arizona, and east of this line continued west of north to western Nevada, and thence northward over eastern Oregon and western and northern Idaho. The least yearly ranges in temperature occurred over extreme southern Florida, where they were less than 40°; along the middle Pacific coast they were less than 50°; and in Florida south of the thirtieth parallel, on the immediate west Gulf coast, and along the entire immediate Pacific coast they were less than 60°.

ATMOSPHERIC PRESSURE.

The annual mean pressure was highest within an area which covered the east Gulf states, eastern Tennessee, and extreme northern Florida, where the mean readings rose to, or above, 30.10, and was lowest in the lower Colorado valley, where the mean values fell below 29.90. From the region of high pressure over the eastern part of the country there was a gradual decrease in pressure northward to the lower Saint Lawrence Valley, where it fell below 29.95, and from the region of low pressure over the western part of the southern plateau region the mean pressure increased eastward to the Atlantic coast, northward to the British Possessions, and westward to the Pacific coast.

The annual mean pressure was generally above the normal in the interior of the country, and was below the normal on the Pacific coast and adjoining parts of the plateau region, in the